



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,221	09/12/2003	Sean Baggott	1275-19	6822
23869	7590	11/09/2006	EXAMINER	
HOFFMANN & BARON, LLP			DRODGE, JOSEPH W	
6900 JERICHO TURNPIKE				
SYOSSET, NY 11791			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 11/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/661,221	BAGGOTT ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Joseph W. Drodge	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 September 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1 and 3-34 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1 and 3-34 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_ .  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,4,6-24,28,30,31,33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Pittner patent 4,574,049.

Pittner discloses a water treatment system and method for treating water that contains appreciable or relatively large amounts of contaminants including at least carbonates and carboxylic/organic acids (column 4, lines 8-30, especially 15-17 and lines 37-52) in reverse osmosis membranes. The membranes are situated downstream of chemical processing equipment for feeding pH adjusting chemicals { as required in newly added instant claims 30 and 31} and/or bacteriostatic chemicals (figure 1 and column 6, lines 9-19); also see a sodium hydroxide feeding system {for claim 33} and chemical deaeration processing equipment that are upstream of at least one of the membranes (more detail in the next paragraph).

For apparatus claims 19-23, Pittner discloses water feed conduits coupled between upstream pre-treatment members including carbon filter 16 [as in claims 22 and 23] and 1<sup>st</sup> reverse osmosis (RO) systems 50 and 52 (each having inlet and permeate and reject outlets) and also coupled between systems 50 and 52 and 1<sup>st</sup> or 2<sup>nd</sup> reverse osmosis system 74 (also having inlet 100, reject outlet 102 and permeate outlet 104). Conduit 130 and mixing conduit 122, feeding pH adjusting chemicals and/or bacteriostat chemicals are upstream of and in-line of the reverse osmosis

membranes (figure 1 and column 6, lines 9-19). Conduits 130 and 122 thus constitute “chemical processing equipment” since they mix chemicals with the feed water in water treatment process steps. Sodium hydroxide storage tank with pump 80 and feed line 78 also constitutes chemical processing equipment since the NaOH chemically processes the water (column 4, lines 12-18). For claims 20 and 34, see pumps 42 and 84 and pressure-regulating valve 46. For claim 21, the permeate from 1<sup>st</sup> reverse osmosis system 50 or 52 feeds into downstream 2<sup>nd</sup> RO system 74.

Regarding independent method claims 1 and 24, the chemical processing, 1<sup>st</sup> and 2<sup>nd</sup> RO system providing, water feed providing and pressure applying/adjusting steps were discussed with respect to claim 19. Pittner additionally discloses removal of contaminants beginning at column 1, lines 9-19 and pH adjustments at column 4, lines 44-48, etc. For claims 2,17,18 and 27 carbonate and organic contaminants are removed (column 4, lines 27-30 and 40-42).

Regarding various other dependent claims, Pittner also discloses the following: for claims 6,7,9 and 26, adjustment of pH upstream of the 1<sup>st</sup> RO system (column 6, lines 9-13), for claims 8 and 9 and upstream deaerator (column 6, lines 4-5), for claims 10,11,23 and 28 upstream components including NF filtration and activated carbon filter (column 2,lines 63-68), for claim 12 a pressure within recited range at column 3,line 65, for claim 13, temperature adjustment at column 3, lines 7-11, for claim 14 removal of most of the contaminants at column 4, line 55, for claim 15, recycling of permeate to a point of use (column 2, lines 38-40), for claim 18 adjustment of pH for 2<sup>nd</sup> RO system

Art Unit: 1723

(column 4, beginning at line 5), for claim 20 upstream pump 10 and pressure reducing or control device 84, for claim 21, 2<sup>nd</sup> pump 84.

Claims 1,6-10,12-22,24-26,28,30,31,33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Mukhopadhyay patent 5,925,255. Disclosed are method and apparatus for removing inorganic and organic contaminants from waste water downstream of and in-line with hydrocarbon/chemical processing equipment, including reverse osmosis system membrane(s) (column 23, lines 49-62). For claims 1,20,24 and 29, pressure is applied to the feed stream by pump 26. For the independent claims and especially claims 17 and 27, contaminants include organic acids and other organic materials (column 23, line 57). For claims 6,7,9,16,18 and 24-26, and also claims 30,31 and 33, pH is adjusted by addition of any of strong bases, i.e. "caustic" chemicals or acids (elements 13-16 of the figures). For claim 8, see decarbonator/dearator 20. For claims 10,11,22 and 28, see pre-treatment ion exchange component 12. For claims 12 and 34, see elevated pressures at (column 21, lines 14-55). For claims 13, the temperature of operation may be ambient or somewhat elevated (as the Specification is silent as to any heating or cooling of the feed stream). For claims 14, a high percentage of contaminants are removed from the permeate (Table 1 of column 16). For claim 15, the permeate is recycled to the refinery/hydrocarbon process (column 23, lines 53-54). For claims 16-18,21,22 and 24-29, RO membranes in series are discussed at column 22,lines 6-39 and column 23, lines 18-25).

Claims 1,3-7,10-14,19, 20 and 30-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Dyke patent 6,054,050. Disclosed are method and apparatus for

removing inorganic and organic contaminants from waste water downstream of and in-line with hydrocarbon/chemical processing equipment, including reverse osmosis system membrane(s) (Abstract, column 1, lines 43-67). For claims 1, and 20, pressure is applied to the feed stream by pump (column 5, lines 2-6). For the independent claims and especially claims 3,5 and 34, the contaminants include ammonia or ammonium and other organic materials (column 2,lines 14-28 and column 5, lines 55-65). For claim 4, the membrane may be a thin-film composite (column 4, lines 44-46 and be of a spiral-wound module (column 4, lines 58-59). For claims 6,7,30,31 and 33, pH is adjusted by addition of any of strong bases (column 5, lines 61-63). For claims 10,11, see pre-treatment ultrafiltration membrane (column 2, lines 47-65, etc.). For claims 12, see elevated pressures at . For claims 13, the temperature of operation may be ambient or somewhat elevated . For claim 14, a high percentage of contaminants are removed from the permeate (column 4, lines 10-13).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muknopadhyay in view of Dyke. Claim 23 differs in requiring the pre-treatment to include nanofiltration or ultrafiltration . Dyke teaches such ultrafiltration preceding RO treatment of waste water from chemical or oil refinery equipment (column 3, lines 16-29). It would have been further obvious to have utilized the ultrafiltration of Dyke in the system of Mudkohpadhyay to remove insoluble inorganic contaminants and extend the useful life of the reverse osmosis membranes.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dyke patent 6,054,050 in view of Mukhopadhyay patent 5,925,255. Regarding claim 4 Dyke discloses spiral wound membranes that may be in the form of a flat sheet (column 4, lines 52-62). The claims require the membrane to be a thin-film composite. Mukhopadhyay teaches thin-film composite RO membranes employed optionally for refinery waste water treatment (column 10, lines 19-29). It would have been obvious to one of ordinary skill at the time of the invention to have employed the thin-film composite membrane configuration of Mukhopadhyay as the spiral wound membranes of Dyke, since thin-film composite membranes are resistant to changeable and varying pH levels of the feed stream.

Claims 3,5,27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pittner in view of Collentro et al patent 5,766,479. Claims 3,5 and 27 differ from Pittner in requiring nitrogen or amine contaminants. Collentro teaches removing various contaminants by RO systems in series to produce ultrapure water as in Pittner, with contaminants removed including ammonia (column 1,lines 5-16 and column 8, lines 55-62). It would have been obvious for one of ordinary skill in the art to have operated the Pittner system to remove ammonia or other nitrogen-containing contaminants, since Collentro teaches that presence of such substance precludes the water product from having ultra-pure properties.

Art Unit: 1723

Claim 29 differs in requiring the 2<sup>nd</sup> RO system to receive retentate from the 1<sup>st</sup> upstream RO system. However, it would have been obvious to have directed retentate from the 1<sup>st</sup> RO system of Pittner to a downstream RO system, since Collentro teaches that such processing ultimately results in a higher yield of ultrapure water product.

Claims 4,25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pittner in view of Tonelli et al patent 5,997,545.

Regarding claim 4 that requires an RO membrane to be spiral wound, it would have been obvious to have utilized such type membrane in the Pittner system, since Tonnelli teaches in a further system of RO systems in series, that spiral wound membranes (column 4, lines 37-41) have high contaminant loading or removal capacities.

Regarding claims 25 and 26 which require tanks utilized in the pH adjusting steps, it would have been obvious to have utilized tanks in mechanisms for feeding pH adjusting chemicals to the feed in the Pittner process, since Tonelli uses containers, i.e. tanks to add such chemicals at column 9, lines 20-27 with the inherent advantage of allowing for larger flow volumes of such chemicals to treat larger volumes of water.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muknopadhyay in view of Dyke. Claim 23 differs in requiring the pre-treatment to include nanofiltration or ultrafiltration . Dyke teaches such ultrafiltration preceding RO treatment of waste water from chemical or oil refinery equipment (column 3, lines 16-29). It would have been further obvious to have utilized the ultrafiltration of Dyke in the

Art Unit: 1723

system of Mudkohpadhyay to remove insoluble inorganic contaminants and extend the useful life of the reverse osmosis membranes.

Applicant's arguments filed on September 29, 2006 have been fully considered but they are not persuasive. It is argued that Pittner does not disclose a system that is in-line and downstream of hydrocarbon or chemical-processing equipment in an industrial system where many contaminants including hydrogen and ammonia are "prevailing at high levels". It is submitted that the claim language is silent as to requiring the water treated to be effluent from industrial equipment such as present in the petrochemical industries. The claim language remains deemed broad enough to encompass **equipment** such as supply tanks and conduits for adding **any of various chemicals** and mixing them with water being flowed to downstream reverse osmosis membranes, **so as to process the feedwater being sent to the reverse osmosis system.** Instant claim language does not contain any limitation directed to "oil refining equipment" or "chemical refining equipment" such as argued specifically at various pages of the submitted Remarks. The rejections of the claims over Dyke and Mukhopadhyay, respectively, are in fact directed to reverse osmosis treatment of waste water from industrial oil and/or chemical refinery plant operations.

Claim terminology "large proportion" regarding contaminants is deemed to be a relative term, language concerning specific amounts of contaminants, such as specific ppm of contaminants present is absent from the claims.

Each of the independent claims requires only one or more of various types of contaminants, presented in Markush Group claim language; therefor, presence of each of nitrogen-containing compounds , together with organic acids and other chemicals is not required to anticipate the claims.

It is variously argued that Pittner does not disclose or suggest: "an industrial setting", "presence of hydrocarbons at high prevailing levels", "wastewater from Sour Process Condensate" or a system that is "oil and grease or total organic compound tolerant". It is averred that none of the instant claims contains any language requiring any such conditions.

The Remarks further argue that the presence in Pittner of an ion water softener, a carbon filter, a cartridge filter a "Film-Tech membrane", treatment of water soluble organics, setting of two stages of pH levels, and adjusting of pH to levels as low as 5, all indicate that the Pittner system is adapted towards use in a pure water purification system rather than in an industrial setting. It is submitted that the claims are silent as to negative limitations precluding any of these features of Pitts and do not define any particular industrial system with any particular level of contaminants.

It is argued that the Mukhopadyay and Dyke references teach use of ion exchange resin, and a pretreatment process for removing a solute and a water softener. Again, the claims are silent as to precluding any such features. The Response to the arguments against applying Pittner against the claims applies *mutatis mutandis* to Mukhopadyay. Addressing the argument pertaining to ammonia or amines, these are only one possible contaminant included in the Markush Group.

It is argued that Dyke does not disclose removal of ammonia liquid. The independent claims merely include the much broader designation of "one or more of nitrogen-containing compounds", while dependent claims require presence of either ammonia or amines, in any form, not necessarily "liquid ammonia".

Application/Control Number: 10/661,221  
Art Unit: 1723

Page 12

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached at 571-272-1151. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

November 1, 2006

  
JOSEPH DRODGE  
PRIMARY EXAMINER